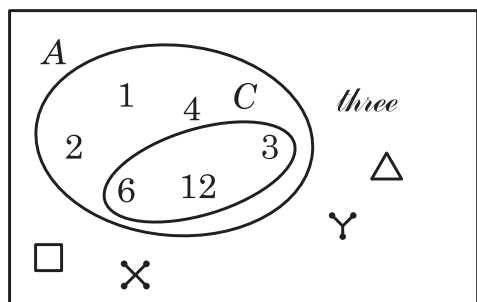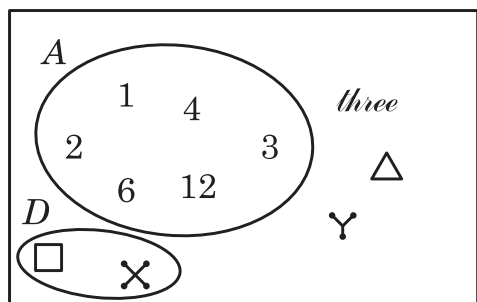# Ontology and Dialectics

THE FRONT PAGE ARTICLE used a universe $\mathscr{U}$ and three sets, *A, B* and *C*, as examples, of which only two were represented in the Venn diagram. The following diagram shows the sets *A* and *C*.

These illustrate the *inclusion relationship,* which links one set to another. Since all of the elements in *C* are also in *A,* it is said that *C is included* in *A* or that *C* is a *subset* of *A.* Formally, $C \subset A$.

In general, for any two sets it could be: that they have common as well as individual elements (the case with *A* and *B*), that only one has individual elements and the rest of them are common (the case with *A* and *C*), or that they do not have common elements. This last one would be the case with *A* and *D,* where *D* is the set of non formal representations of the number 4:

$$D = \{\square, \times\}.$$

Such a situation is illustrated in the following diagram.

The sets of this type are called *disjoint* sets and the criteria used to define them are called *exclusive.* Disjoint sets can also be of two kinds: *non-complementary disjoint sets* (the case with *A* and *D*) and *complementary disjoint sets* (the case with *A* and *~A*). In this last case, gathering together the elements of both sets, creates a set with all the elements of the universe.

The set that gathers together the elements of two sets to form a new set is called *union* and the operation is denoted as $\cup$. Thus, for example, $A \cup B = \{2, \triangle, 6, 1, Y, 4, 3, 12, three\}$. The set created from the elements that two other sets have in common is called *intersection* and the operation is denoted as $\cap$. Thus, for example, $A \cap B = \{3\}$. If there are no elements

in common (the case with disjoint sets), it is said that the intersection is *empty:* $A \cap D = \{\}$.

So, based on the above, for complementary disjoint sets we have that:

$$A \cap {\sim}A = \{\}; \ A \cup {\sim}A = \mathscr{U}.$$

The last of the two conditions will not be true in the case of non-complementary sets. The union of complementary disjoint sets bears a unique result, $\mathscr{U};$ the union of non-complementary disjoint sets could bear many results. And this forces us to express it as: $A \cup D \neq \mathscr{U},$ of which we could say the same thing (nothing good) as what we said about the non-membership relationship. The notation $\neq$ is the same thing as saying "it is not equal to" and, therefore, it represents a denial.

Ontology deals with exclusive complementary definitions. An ontological problem would be to ask oneself: What is a natural divisor of 12? On to a different matter, ontology could ask: What are sports? What is education? What is science? But most of the times, these questions, and many others, involve concepts that don't have complements which can be given a usual name. For example: What is the complementary concept for "sports?" And the one for "education?" And the one for "science?" In these cases it is often useful to use another concept to contrast it with. Thus, "sports" could be opposed to "game," "education" to "instruction," "science" to "religion." That art, the art of testing definitions whose subject is the entity not as entity but rather in relation to other entities, is called *dialectics,* and it can also be called the *second philosophy* (see the Historical Note). Ontology, dialectics and—as will be seen later—logic, form the basis for the Western philosophical thought.

Ontology deals with defining entities or with discovering the criterion used to define an entity; then, dialectics confronts definitions in the same universe. In the case of the "sports versus game" opposition, that which is understood by sports, and that which is understood by game must be clearly defined at first. For example, to discover what the underlying criterion for the sports set is, an *ontological table:* sports versus not sports, could be drawn first. The elements on both columns are the universe being considered. The column headings are

To be or to be not

The preceding paragraph is filled with subtlety and I invite the reader to read it again. Membership and non-membership have different entities. A membership relationship is an affirmation, while a non-membership relationship is a denial that opens up multiple possibilities. If an element belongs to *A*, there are no doubts: it is a divisor of 12. If it does not belong to *A,* it could be a word, a figure, a doodle… But the solution is found in the problem itself: if an element does not belong to *A*, it is a *not divisor of 12.* An element is a divisor of 12 or it is a not divisor of 12.

Whoever establishes the criterion that defines a set faces a dilemma: If the element does not fall within the set, it remains within its complement. But this fact should not torment him—as the existential question did the Prince of Denmark in Shakespeare's tragedy—because that is precisely the strength of the set membership, i.e. the strength of being.

How to collaborate

The Eleatic School

THE SET THEORY, mentioned in the front page article, was developed in the 19th century. The word "set" (in German, *Menge*) was used for the first time by the bohemian mathematician, logician, philosopher and theologian, Bernhard Bolzano. At the beginning of the 5th century B.C., the Greek philosopher, Parmenides of Elea, has formulated the problem differently.

In his poem, *"The Way of Truth,"* Parmenides describes first his journey on a chariot pulled by beasts of burden—in what would be the description of a mystical voyage, a rite of passage or, simply, an inner search—and then he tells us that a goddess instructs him. The chariot must take one of two roads: *the authentic* or *the unnamable*. Regarding this, the poem reads as follows (see the text frame).

μόνος δέ ἔτι μῦθος ὁδοῖο λείπεται ὡς ἔστιν·
ταύτη δέ ἐπὶ σήματέ ἔασι πολλὰ μάλέ,
ὡς ἀγένητον ἐὸν καὶ ἀνώλεθρόν ἐστιν,
οὖλον μουνογενές τε καὶ ἀτρεμὲς ἠδέ ἀτέλεστον·
…
ἡ δὲ κρίσις περὶ τούτων ἐν τῷδ´ ἔστιν· ἔστιν ἢ οὐκ ἔστιν·
κέκριται δέ οὖν, ὥσπερ ἀνάγκη,
τὴν μὲν ἐᾶν ἀνόητον ἀνώνυμον, οὐ γὰρ ἀληθής ἔστιν ὁδός,
τὴν δέ ὥστε πέλειν καὶ ἐτήτυμον εἶναι.

There is only one road: that of what is.
In it there are signs in abundance,
because the entity, as it is,
    is unborn and undying,
it is integral, homogenous, imperturbable and continuous.
…
The issue here is the following: "To be or not to be."
But it is already decided, as it should,
to set aside the unnamable and unthinkable road,
    because it is not true,
and take the other, that of what is, the authentic one.

The first two adjectives on the fourth line of the first paragraph ("whole" and "homogenous") are very important. Together they could be translated as "unique." A translation here is not easy since the fragment appears in various forms in the works of Sextus Empiricus, Clement of Alexandria and Simplicius, and must be done by meaning. The set membership that gives rise to a dilemma (you are or you are not), is clear. And clarity is the light that illuminates the universe and makes it possible to group the elements. Thus Parmenides qualifies the road of being as "authentic," "genuine" or even "true." However, this last word has a meaning today that could lead many astray of Parmenides' thoughts, and even more so if the word "effective" were to be used there instead. Plato went even further when he said: "Good is One" (Here "Good" must be interpreted as "What is Right.")
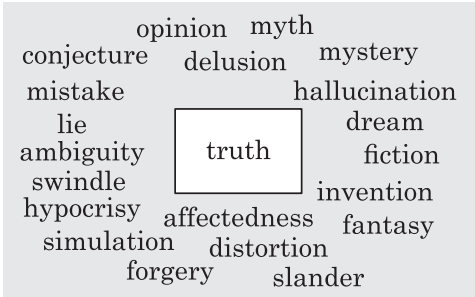
The association of light with being, which comes from seeing the entity as "that which is not hidden," it is an image of great symbolic value, which could be expressed as:

being ↔ light ↔ truth,

while

not being ↔ shadows ↔ opinions.
The light (clarity) as opposed to the shadows (confusion); the truth as opposed to opinions. Oneness is the primary quality of being, and all others are derived from it. Some people have a natural predisposition towards the light ("clear minds"); others do not. Paraphrasing the smart French essayist, Jean Brun (1919–1994), you could say that: *while some cast a light in search for truth, others fish in the murky waters of opinions.*

The "unnamable" road is not strictly only that of opinions, in the sense that this word has for us today. It is also that of myths, created with the language of poets, of multiple meanings and interpretations. This is what led Plato to propose, in *"The Republic,"* that the activities of the poets be kept under control. With the study of entities, which is called *ontology,* philosophy is born. That is why Aristotle called it the *first philosophy*. This birth came about during a moment in history when poetic language started generating confusion and lost its prestige as a means of communication in favor of prosaic language, in which every word has a unique meaning. If we combine the meaning of the words "opinion," "conjecture," "myth," "mystery," "delusion," "hallucination," "dream," "fiction," "invention," "fantasy," "error," "lie," "ambiguity," "swindle," "hypocrisy," "affectedness," "simulation," "distortion," "slander"—which jointly can be replaced by "falsehood"—the opposite of which would give us what was known as "truth" in ancient times.

opinion myth
conjecture delusion mystery
mistake hallucination
lie dream
ambiguity truth fiction
swindle invention
hypocrisy affectedness fantasy
simulation distortion
forgery slander

Parmenides started a current of thought, known as the *Eleatic school,* which influenced many great thinkers. His main idea is found in the first line of the second paragraph: *"The issue is: To be or not to be."*

Ontology and Dialectics
(continued from page 2)

the names of the two complementary disjoint sets.

sports	not sports
▪ marathon	▪ professional soccer
▪ amateur rugby	▪ boxing
▪ rowingemo	▪ chess
▪ discus throw	▪ horse racing
▪ open water	▪ motoring
swimming	▪ poker
▪ cycling	▪ trekking
	▪ bowling

Upon observation, these lists show us that—as far as the sports-not sports dilemma goes—whoever made the table used a criterion that excluded from sports such things as: professional activities, those that do not lead to better health, those that do not imply any physical activity, those that promote gambling, those in which human beings share the merit with animals or machines, those that are for profit, those that are not competitive, and those that have no rules or organizations that define and apply them. With this kind of table, sports can be given a definition that would still serve in the future to place any activity in one or the other column. In defining what is understood to be a sport that which is a not sport is also defined, since the criteria for sport and not sport are exclusive and complementary. The same could be done to discover the criterion that gives rise to the concept of games. Once the meaning of both terms is clarified, the dialectic counterpoint can determine the relative position of the Sports and Games sets.

Dialectics examines the existing relationship between concepts, but does not try to change them. The definition already existed before. The proposal of paradoxes and the discussions that might arise from the confrontation of concepts are the responsibility of those who do so, who are generally not philosophers or are philosophers who have taken time off to go on vacation.

"Ask Jotajota"

This is the title we will use for the section where the author responds to the readers' questions. It will be formatted similarly to the section with the same title on the Academy's website. The printed version will only include answers to questions related to the topics covered in the last issue, selected according to the space available. However, no question shall be unanswered. The remaining questions shall be published in the online version of the supplement. Questions must be sent to the author's email address: jjluetich@luventicus.org.